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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/507,175

09/10/2004

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EXAMINER

RODGERS, COLLEEN E

ART UNIT

PAPER NUMBER

2813

MAIL DATE

DELIVERY MODE

05/20/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/507,175	Applicant(s) AGA ET AL.	
	Examiner Colleen E. Rodgers	Art Unit 2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 February 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-11, 16-19, 24-27, 32-35, 40 and 41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-11, 16-19, 24-27, 32-35, 40 and 41 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/31/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action responds to the Amendment filed 13 February 2008. By this amendment, claim 8 is amended and claim 41 is newly added.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 8-11, 16-19, 24-27, 32-35, 40 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Aga et al** (USPN 6,372,609).

Regarding claim 8, **Aga et al** disclose a method of producing an SOI wafer having a buried oxide film **3** with a thickness of less than 100 nm, comprising:

forming an oxide film **3** having a thickness of 100 nm or more [see col. 5, lines 58-61] on a surface of at least one of a bond wafer **2** and a base wafer **1**, bonding the bond wafer **2** to the base wafer **2** through the formed oxide film **3** [see Fig. 1, step D], and making the bond wafer **2** into a thin film to form an SOI layer [see Fig. 1, step E], wherein the total thickness of the oxide film formed on the surface of at least one of a bond wafer and a base wafer is thicker than the thickness of the buried oxide film formed thereby, and thereafter, an obtained bonded wafer is subjected to heat treatment [see Fig. 1, step F] to reduce the thickness of the buried oxide film.

Aga et al do not specifically disclose that the thickness of the buried oxide is reduced to less than 100 nm by the heat treatment. However, these claims are *prima facie* obvious without a showing

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that the claimed ranges achieve unexpected results relative to the prior art range. *In re Woodruff*, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also *In re Huang*, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996) (claimed ranges of a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also *In re Boesch*, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill of art) and *In re Aller*, 105 USPQ 233 (CCPA 1955) (selection of optimum ranges within prior art in general conditions is obvious). In this case, there exists no evidence of record that the claimed heat treatment provides unexpected results in the thickness of the buried oxide layer produced. One of ordinary skill in the art would be motivated to optimize the thickness of the buried oxide layer to provide for device performance.

Regarding claim 9, **Aga et al** disclose the method of claim 8 as described above, furthermore wherein the SOI layer formed is 400 nm in thickness [see col. 9, lines 54-55].

Regarding claims 10 and 11, **Aga et al** disclose the methods of claim 8 and 9, respectively, furthermore wherein a heat treatment is performed in an inert gas atmosphere, at a temperature of 1000-1300°C [see col. 6, lines 24-34].

Regarding claims 16-19, **Aga et al** disclose the method of claims 8-11, respectively, as described above, furthermore wherein before the bond wafer is bonded to the base wafer, hydrogen or rare gas ions are implanted into the surface layer portion of the bond wafer to form an ion-implanted layer, and after the ion-implanted surface of the bond wafer is bonded to the base wafer, the bond wafer is delaminated at the formed ion-implanted layer to make the bond wafer into a thin film [see col. 6, lines 1-13; see also Fig. 1, steps C and E].

Regarding claims 24-27 and 32-35, **Aga et al** disclose the method of claims 8-11 and 16-19, respectively, as described above, furthermore wherein after the heat treatment is performed, sacrificial oxidation is further performed [see col. 6, lines 47-49].

Regarding claim 40, **Aga et al** disclose an SOI wafer produced according to the method of claim 8.

Regarding claim 41, **Aga et al** disclose the method of claim 8. **Aga et al** do not disclose wherein the heat treatment to reduce the thickness of the buried oxide film is performed for 4 hours or more, but rather for a time up to 2 hours. However, these claims are *prima facie* obvious without a showing that the claimed ranges achieve unexpected results relative to the prior art range. *In re Woodruff*, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also *In re Huang*, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996) (claimed ranges of a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also *In re Boesch*, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill of art) and *In re Aller*, 105 USPQ 233 (CCPA 1955) (selection of optimum ranges within prior art in general conditions is obvious). In this case, there exists no evidence of record that the two hour difference in disclosed time provides unexpected results in the buried oxide layer produced. One of ordinary skill in the art would be motivated to optimize the time for which the thinning heat treatment is performed to provide for processing limitations, including but not limited to the cost of the process and the results attained.

Response to Arguments

4. Applicant's arguments filed 13 February 2008 have been fully considered but they are not persuasive. On pages 6-7 of the Remarks, Applicants allege that the instant claims differ from **Aga et al** in that **Aga et al** do not disclose wherein the buried oxide film is reduced by more than 20 nm by the heat treatment disclosed. The Examiner, again, concedes that this is so. However, the Examiner has made a *prima facie* case of obviousness regarding the results obtained by the method of **Aga et al** in contrast to the claimed method. Specifically, the Examiner has repeatedly invited Applicants to provide **evidence** of unexpected results regarding the differences in the time for which the heat treatment is applied. Applicants have, as yet, not provided any such satisfactory evidence. Therefore, the Examiner's rejection stands. As explained in the rejection dated 13 November 2007, the Declaration filed 31 July 2007 fails to provide evidence of unexpected results because there are **no results** included that prove that the disclosure of **Aga et al** is insufficient to attain the thickness reduction of 20 nm or more.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be

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calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colleen E. Rodgers whose telephone number is (571) 272-8603. The examiner can normally be reached on Monday through Friday, 8:00 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Carl Whitehead Jr./
Supervisory Patent Examiner, Art Unit 2813

/C. E. R./
Examiner, Art Unit 2813